

Controlling the particle size of amorphous iron nanoparticles

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A method for controlling the particle size of amorphous iron, which was prepared by the sonication of iron pentacarbonyl $[\text{Fe}(\text{CO})_5]$, is reported in this paper. The sonolysis was performed on neat $\text{Fe}(\text{CO})_5$ and its solutions in decane whose concentrations were 4 M, 1 M, and 0.25 M. The iron nanoparticles were subjected to TEM (Transmission Electron Micrograph), ESR (Electron Spin Resonance), TGA (Thermogravimetric Analysis), DSC (Differential Scanning Calorimetry), and Quantum Design SQUID magnetization measurement. The measured properties demonstrated a strong dependence on the concentration of the solution, e.g., particle size.

Keywords: Glasses, metallic; Magnetic properties; Nanophase

Materials: Fe

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